

## Learning about the Environment through Experiential Education Projects (LEEEP)

The LEEEP program is currently in its eighteenth year at Marion Cross School. This enrichment component of the life sciences program seeks to engage children in appreciation, understanding, and inquiry about their local natural world, and our collective responsibility towards it. The coordinator, Lindsay Putnam, directs these environmental science inquiry studies and assists classroom teachers with related curriculum development.

### Habitat Studies

Each grade level at Marion Cross School studies a particular habitat in our local environment. Grade 1 studies the meadow ecosystem; Grade 2 visits Blood Brook; Grade 3 explores and investigates the forest habitat; Grade 4 visits ponds, beaver ponds, vernal pools, and bogs; Grade 5 studies local rivers and streams, including conducting a study of the macroinvertebrate population of Blood Brook and a correlating water quality survey; Grade 6 learns about the marine environment with their classroom teachers, and, locally, works in the school garden and in the Nature Area.

### Field Trips

Field trips are hands-on science investigations. Students explore, generate questions and hypotheses, collect data, discuss their findings, and develop new questions. Investigations include first graders measuring and comparing winter temperature differences between the outside air and the subnivean world of the meadow, and second graders making discoveries about stream organisms and the habitat zones in which they live. Second graders go on an annual trip to discover the source of one of our local brooks and explore it to its mouth at the Connecticut River. Third graders document forest animal tracks in the Nature Area; then in Technology class they organize that information and learn how to ask questions of the data to understand animal populations and habitats. Fourth graders might discover that the dissolved oxygen content or turbidity levels of a pond are not within the ideal range for aquatic life and investigate what the cause might be. Fifth grade students hypothesize brook water quality based on organism observations, then do an investigation to collect and analyze data to determine the actual water quality score.

Students have created photographic and informational displays at the town post office and library of their field trips, and made presentations to the Norwich Conservation Commission. Sixth graders, by way of a mapping and writing project, were instrumental in securing funding for trail development grants for the "Parcel 5" multi-use recreational trail system. Our goal in the LEEEP program is for projects to be meaningful, authentic, and relevant to the lives of our students and the community.

### Stewardship

An important component of the LEEEP program is environmental stewardship. Each grade level does a stewardship and/or community service project in their habitat study area. Every year some annual projects are continued, and new projects are initiated. Annual projects include the fifth grade water quality study of Blood Brook, and the on-going vernal pool monitoring project in fourth grade. The information from these two projects are shared with the Norwich Conservation Commission. In the case of the vernal pool project, new breeding pools that fourth graders document are added to the town map; one year 4th graders produced an illustrated book of vernal pool organisms which is at the school and town libraries. Another annual event is the second grade "Leave No Trace at the Stream" day, where all second graders learn how to be good stewards of stream habitat.

Fifth grade students have worked with the White River Partnership in their "Trees for Streams" project to plant several hundred new trees along a highly eroded branch of the White River. In subsequent years, they have planted willows and dogwoods on eroded sections of Blood Brook. First graders have been "bird angels" for our winter population of Nature Area birds (spreading seed into first grade snow angel shapes out in the Meadow). Classes have painted and installed beautiful new trail markers for the Ballard and Nature Area trails, and pulled thousands of stems of invasive buckthorn. The whole school community comes together in the fall for "Fall Clean Up Day" and again in the spring for "Green Jobs Day".

### The School Garden

Marion Cross School has a school vegetable garden! Due to the generosity and neighborliness of the Turco family, we are able to have a garden on land adjoining the school playground. Students are actively learning about how food grows and how good it tastes when you grow it yourself. In third and fifth grades they are learning about soils, nutrients, and requirements for healthy plant growth. Fifth graders study the periodic table of elements and learn about the nitrogen cycle. Third grade studies decomposition and works on processing the compost. In 2014, two third graders made a video for the school community about what they had discovered in working in the compost bins and asking how we could waste less food. Sixth graders put their big-kid muscles to work doing the bulk of "putting the garden to bed" in the fall, and helping to prepare the new beds in the spring. Kindergarteners and second graders plant seeds, water, and help harvest salad greens. Parent volunteers and upper grade student helpers help Lindsay put on a school-wide "Salad Day" in the spring; and in the fall, a Harvest Meal, supplemented by local bread donated by King Arthur Bakery. Vegetables which aren't used by the school are donated to the local food shelf.

In sugaring season, we sugar! We learn how to tap trees, collect the sap, and boil it down to just the right density and sweetness. We learn about the science, the history and the stories and music of sugaring. We taste a lot of sap, and we have a school-wide "sugaring off day" at the end of the season. We have been operating our sugaring out of a pop-up tent, but are currently exploring the possibility of building a real sugarhouse. This would enable generations of Marion Cross students to learn about this most magical of Vermont seasons.

### Cross-Curricular Projects

Lindsay continues to work with Rick Newton in Physical Education to teach students the art and sport of orienteering - map and compass navigation. Map reading is not only an important life skill, it is a fundamental tool for collecting scientific data. Lindsay and Rick have established an annual off-campus orienteering trip to test the map reading skills of all sixth graders before they graduate.

Our wonderful art teacher, Caitlin Eastman, asks students to explore their creativity about the natural world in many nature related art projects. Check out Caitlin's website for examples of nature related art.

Fifth graders participate every year in "River Day". We learn about and celebrate the science of river ecosystems, and the human and geologic history of the Connecticut River. We paddle canoes down the river to sample aquatic life, see how the wastewater treatment plant in Hanover processes incoming water, and learn about ecology and Abenaki folklore. Fifth grade has also recently partnered with Trout Unlimited to raise brook trout eggs in the classroom for release into a local brook. This project incorporates ecology, chemistry, and hydrology. It requires students to be responsible managers and precise data collectors. Their successful efforts culminate in the great event of releasing the young fish into the brook where observant students may be lucky enough to see them grow to adulthood.

Since 2004, sixth graders have participated in a Team Building Day with Lindsay. We have adventured at sites from northern to central Vermont and across the river to Hulbert Outdoor Center and Dartmouth College Ropes Course. Most recently we have had wonderful experiences on both the high and low ropes courses at the Dartmouth facility. Students have been highly challenged and have risen to those challenges. We have been brave, caring, thoughtful, and inspired. We have come out stronger than when we went in.

### EcoSchool

Marion Cross School has joined a new international initiative sponsored by the National Wildlife Federation called EcoSchool. This program is a structured, interdisciplinary, whole community approach to "greening" the school, the community, and the planet. Projects we have undertaken so far include "Green Hour" with a focus on increasing our time spent outdoors, promoting our Bike and Walk to School program with reward buttons that children wear, and increasing our classroom participation in recycling and composting.

### Thank you

These are a few examples of LEEEP projects and investigations. In all we do, we embrace the power of adventure, of authentic experience, and the vitality of our connection with the natural world. The program is a collaborative, cross-curricular venture which would not be successful without the efforts, energy, and support of teachers and educational assistants, community members and countless parent volunteers. Its many projects, these eighteen years would not have been possible without the generosity of the Milton Frye Fund for Experiential Education, the Norwich Women's Club, the Norwich Conservation Commission, the Norwich Lions Club, the Bryne Foundation, the Marion Cross PTO, and a few special anonymous donors. Thank you to all who have participated and supported this program, thereby making a lasting difference in the lives of our children.